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DEVICE FOR REMOVING GRINDING WHEELS FROM GRINDERS

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Fig. 1

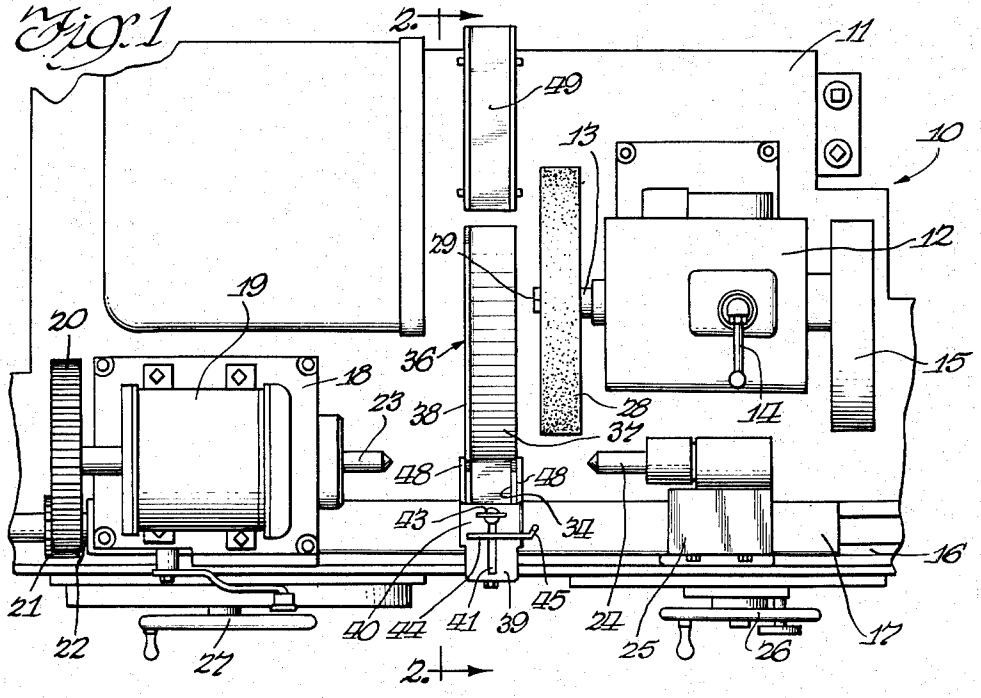


Fig. 2

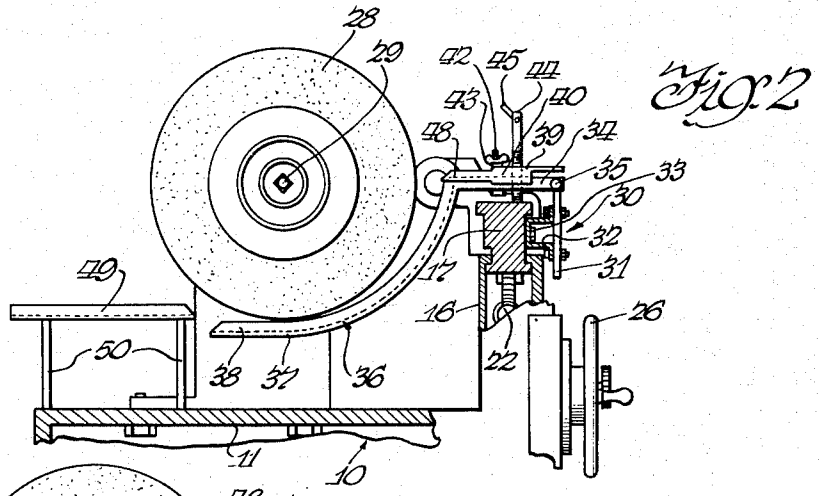
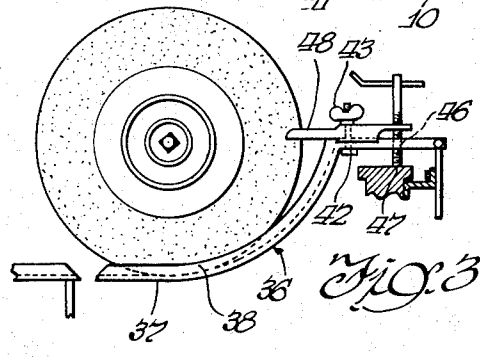


Fig. 3



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DEVICE FOR REMOVING GRINDING WHEELS FROM GRINDERS

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13 Claims. (Cl. 51—262)

This invention relates to an attachment for a grinding machine. More specifically, it relates to a device adapted to be connected to a grinding machine for assisting in the removal of grinding wheels from grinding machines.

In the operation of automatic grinding machines, it is frequently necessary for the operator to change the grinding wheel. Change-over from one grinding wheel to another has heretofore been a tiresome and somewhat dangerous task. Grinding wheels of the type employed in these grinders are very heavy and hard to handle. During removal, the grinding wheel is slipped endwise off of the drive shaft; and as it comes off, it often cannot be adequately controlled and lifted from the machine because of the cramped and close quarters inherent in a machine of this type. As a result, operators have had great difficulty in removing the grinding wheels, and have been subjected to injuries because of the difficulties encountered. It is a prime object, therefore, to provide an attachment for a grinding machine which can be quickly placed into position whenever it is necessary for the operator to remove the grinding wheel.

Still another object is to provide an attachment for removing grinding wheels, the attachment including provisions whereby it may be attached to the reciprocating slide of the grinder so that the attachment may be easily adjusted in position underneath a grinding wheel for assisting in the removal thereof.

A still further object is to provide a device for assisting in the removal of grinding wheels from grinding machines, the device including a cradle which is adapted to receive the grinding wheel and hold it in an upright position after it has been removed from the shaft or spindle of the grinding machine, the device including adjustments whereby the cradle may be easily placed in position for receiving the grinding wheel.

These and further objects will become more readily apparent from a reading of the specification when taken in connection with the accompanying sheet of drawings.

In the drawings:

Figure 1 is a plan view of a portion of a grinding machine showing a device connected thereto for assisting in the removal of the grinding wheel from the grinder;

Figure 2 is a cross-sectional view taken along the line 2—2 of Figure 1; and

Figure 3 is a detail side view in elevation of a portion of a grinding machine and attachment therefor for removing a grinding wheel from a grinder.

A grinding machine of the automatic type is generally indicated by the reference character 10. The grinding machine 10 may be of a conventional manufacture used in the production grinding of shafts and other similar parts. The machine 10, of this type, generally comprises a base or bed 11 having a transmission box 12 supported thereon. A shaft or spindle 13 projects outwardly from the transmission box 12, the transmission box 12 containing suitable gear mechanism for rotating the spindle 13. The transmission box 12 has supported thereon a control lever 14 which is adapted to conventionally operate mechanism within the transmission box 12 which may be actuated by drive gears (not shown) positioned within a gear enclosure 15.

As indicated above, the type of grinding machine shown here is conventional and the parts are designated in a general manner. As part of the grinding machine 10, a slide housing 16 is provided. The housing 16, as best shown in Figure 2, supports a reciprocating slide member

17. The slide member 17 is movable in a direction substantially parallel to the axis of the spindle 13. The slide 17 includes a support 18 on which a power unit 19 is positioned. The power unit 19 is adapted by means of a gear 20 to drive a pinion 21 which in turn rotates a lead screw 22 to effect longitudinal movement of the slide 17. A spindle 23 projects outwardly from the support 18. A spindle 24 is in axial alignment with the spindle 23, the spindle 24 being mounted on a support bracket 25. The support bracket 25 is suitably positioned on the slide 17 and may be longitudinally moved with respect thereto. An adjustable control member 26 is effective to provide for sliding movement of the support bracket 11 in a conventional manner. A manual control 27 likewise is suitably connected to the slide 17 so that manual adjustment of the slide 17 may be had relative to the base 11 of the machine 10.

A grinding wheel or rotary work-engaging member 28 is positioned on the shaft or spindle 13 to be driven thereby. A nut 29 holds the grinding wheel 28 in driving engagement with the shaft 13. A fixture or device for assisting in the removal of the grinding wheel 28 is generally indicated by the reference character 30. The device 30 includes a vertical bracket 31 which is connected to the slide 17 for movement therewith by means of a U-shaped bracket 32. A removable bolt 33 adequately supports the vertical bracket 31 in the position indicated. A horizontally extending channel-shaped arm 34 is pivotally connected, as indicated at 35, to the bracket 31. A cradle, generally designated at 36, is rigidly secured to the arm 34, the cradle 36 comprising a track 37 having a vertically extending flange 38. The track 37 thus is flanged and is of arcuate shape so that it may conform generally to the outer peripheral contour of the grinding wheel which it will support.

A gripping member provided on the device 30 is generally indicated by the reference character 39. The gripping member 39 comprises a channel-shaped body 40 which is placed over the arm 34 in an inverted position, as best indicated in Figure 1. The body 40 is provided at its upper end with an elongated slot 41 through which a screw 42 projects, the screw 42 being supported by the arm 34. A wing nut 43 is threaded on the screw 42 for tightening the channel-shaped body 40 with respect to the arm 34. Thus, the body 40 or gripping member 39 may be horizontally moved relative to the arm 34 and may be fixed in position by tightening of the wing nut 43. The arm 34 likewise may be pivoted or adjusted on the pivot 35 by means of a screw 44 having a turning handle 45. The screw 44 extends through a threaded opening 46 in the arm 34, the lower end of the screw 44 engaging an upper surface of the slide 17, as indicated at 47 in Figure 3. The gripping member 39 is also provided with laterally spaced fingers 48 which, as indicated in Figure 3, may be moved with the gripping member 39 to engage opposite sides of the grinding wheel 28 for maintaining the same in an upright position.

A second track of channel-shaped design is indicated at 49. The track 49 is positioned in a stationary manner on the bed 11 by means of braces 50. During the operation of the device 10, the operator simply bolts the device onto the slide 17 by inserting the bolt 33, as indicated. He then removes the nut 29 so that the wheel 28 can be removed from the spindle 13. He now turns the screw 44 so that the cradle 36 or track 37 is moved upwardly in the position indicated in Figure 3 whereupon the lower edge of the wheel 28 rests in the track 37. In order to move the device 30 so that the track 37 is in position, he may actuate the manual control 27 so that the slide 17 is moved in position whereupon the track 37 is directly underneath the grinding wheel 28. The operator now moves the gripping device 39 horizontally so that the fingers 48 straddle the wheel 28. The wing nut 43 is tightened and the wheel 28 is firmly supported in an upright position in the cradle 36. The operator now again actuates the control 27 so that the slide 17 is moved until the track 37 is in horizontal alignment with the track 49. The operator then rolls the wheel 28 from the track 37 to the stationary track 49 whereupon it is handled by the operator for subsequent removal.

The device also, of course, is utilized in a similar manner for placing new wheels on the spindle **13**. By simply reversing the operation, the operator can quickly place the new grinding wheel in the position desired. After the wheel has been positioned in place, it is a simple operation to simply remove the fixture **30** by merely removing the screw **33**, thereby slipping the device from the machine. Thus it can be seen that an effective device has been provided for removing grinding wheels or similar heavy rotary work-engaging members from machines wherein it is difficult for the operator to make the change-over.

Thus, the objects of the invention have been fully achieved and it must be understood that changes and modifications may be made which do not depart from the spirit of the invention as disclosed nor the scope thereof as defined in the appended claims.

What is claimed is:

1. A device for removing grinding wheels from a grinding machine, the machine including a base, a shaft rotatably supported on said base, a grinding wheel removably supported on said shaft, and a work-support slide positioned on said base for reciprocation in a direction parallel to the axis of the grinding wheel; comprising a vertical bracket removably connected to said support slide, a horizontally extending arm pivotally connected to said bracket, a cradle for said grinding wheel, said cradle including an arcuate-shaped track member connected to said arm, said track having an L-shaped cross section, an adjustable means including a screw extending through said arm and adapted to engage a portion of said slide whereby said arm may be hingedly raised and lowered thereby adjusting the cradle member relative to said grinding wheel, a gripping member slidably associated with said arm, means adjustably connecting said gripping member to said arm whereby the gripping member may be horizontally adjusted relative to the grinding wheel, laterally spaced fingers on said gripping member, said fingers being movable with said gripping member to engage opposite sides of said grinding wheel upon removal of the same from the shaft and upon positioning of the same in said track of said cradle, and a second channel-shaped track positioned on said base for receiving said wheel from the cradle and for discharging the same from the machine.

2. A device for removing grinding wheels from a grinding machine, the machine including a base, a shaft rotatably supported on said base, a grinding wheel removably supported on said shaft, and a work-support slide positioned on said base for reciprocation in a direction parallel to the axis of the grinding wheel; comprising a bracket removably connected to said support slide, an arm pivotally connected to said bracket, a cradle for said grinding wheel, said cradle including an arcuate-shaped track member connected to said arm, an adjustable means connected to said arm and adapted to engage a portion of said slide whereby said arm may be hingedly raised and lowered thereby adjusting the cradle member relative to said grinding wheel, a gripping member slidably associated with said arm, means adjustably connecting said gripping member to said arm whereby the gripping member may be horizontally adjusted relative to the grinding wheel, laterally spaced fingers on said gripping member, said fingers being movable with said gripping member to engage opposite sides of said gripping wheel upon removal of the same from the shaft and upon positioning of the same in said track of said cradle, and a second channel-shaped track positioned on said base for receiving said wheel from the cradle and for discharging the same from the machine.

3. A device for removing grinding wheels from a grinding machine, the machine including a base, a shaft rotatably supported on said base, a grinding wheel removably supported on said shaft, and a work-support slide positioned on said base for reciprocation in a direction parallel to the axis of the grinding wheel; comprising a bracket removably connected to said support slide, an arm pivotally connected to said bracket, a cradle for said grinding wheel, said cradle including an arcuate-shaped track member connected to said arm, an adjustable means connected to said arm and adapted to engage a portion of said slide whereby said arm may be hingedly raised and lowered thereby adjusting the cradle member relative to said grinding wheel, a gripping member slidably associated with said arm, means adjustably connecting said gripping member to said arm whereby the gripping member may be adjusted relative to the grinding wheel, fingers on said gripping member, said fingers being movable with said gripping member to engage opposite sides of said grinding wheel upon removal of the same from the shaft and upon positioning of the same in said track of said cradle, and a second channel-shaped track positioned on said base for receiving said wheel from the cradle and for discharging the same from the machine.

4. A device for removing grinding wheels from a grinding machine, the machine including a base, a shaft rotatably supported on said base, a grinding wheel removably supported on said shaft, and a work-support slide positioned on said base for reciprocation in a direction parallel to the axis of the grinding wheel; comprising a bracket removably connected to said support slide, an arm pivotally connected to said bracket, a cradle for said grinding wheel, said cradle including an arcuate-shaped track member connected to said arm, an adjustable means connected to said arm and adapted to engage a portion of said slide whereby said arm may be hingedly raised and lowered thereby adjusting the cradle member relative to said grinding wheel, a gripping member slidably associated with said arm, means adjustably connecting said gripping member to said arm whereby the gripping member may be adjusted relative to the grinding wheel, fingers on said gripping member, said fingers being movable with said gripping member to engage opposite sides of said grinding wheel upon removal of the same from the shaft and upon positioning of the same in said track of said cradle, and a second channel-shaped track positioned on said base for receiving said wheel from the cradle and for discharging the same from the machine.

5. A device for removing grinding wheels from a grinding machine, the machine including a base, a shaft rotatably supported on said base, a grinding wheel removably supported on said shaft, and a work-support slide positioned on said base for reciprocation in a direction parallel to the axis of the grinding wheel; comprising a bracket removably connected to said support slide, an arm pivotally connected to said bracket, a cradle for said grinding wheel, said cradle including an arcuate-shaped track member connected to said arm, said track having an L-shaped cross section, an adjustable means including a screw extending through said arm and adapted to engage a portion of said slide whereby said arm may be hingedly raised and lowered thereby adjusting the cradle member relative to said grinding wheel, a gripping member slidably associated with said arm, means adjustably connecting said gripping member to said arm whereby the gripping member may be adjusted relative to the grinding wheel, and fingers on said gripping member, said fingers being movable with said gripping member to engage opposite sides of said grinding wheel upon removal of the same from the shaft and upon positioning of the same in said track of said cradle.

6. A device for removing rotatable work-engaging members from a machining apparatus, the apparatus including a base, a rotatable shaft on the base, a rotatable work-engaging member removably positioned on the shaft, and a work-support slide supported on the base for relative reciprocation in a direction generally parallel to the shaft; comprising a bracket removably connected to said slide, a first-flanged track pivotally connected to said bracket, said track having an arcuate shape adapted to conform generally to the outer peripheral surface of a rotatable member for receiving and supporting the same, means connected to said first track and engaging said slide for adjusting the track vertically relative to a work-engaging rotatable member, a gripping member adjustably positioned on said first track, said gripping member including gripping fingers adapted to engage portions of a rotatable member supported on the first track, and a second track on said base for receiving rotatable members from the first track for discharging the same from the device.

7. A device for removing rotatable work-engaging members from a machining apparatus, the apparatus including a base, a rotatable shaft on the base, a rotatable work-engaging member removably positioned on the shaft, and a work-support slide supported on the base for relative reciprocation in a direction generally parallel to the shaft; comprising a bracket connected to said slide, a first-flanged track pivotally connected to said bracket, said track having an arcuate shape adapted

to conform generally to the outer peripheral surface of a rotatable member for receiving and supporting the same, means connected to said first track and engaging said slide for adjusting the track vertically relative to a work-engaging rotatable member, a gripping member adjustably positioned on said first track and adapted to engage portions of a rotatable member supported on the first track, and a second track on said base for receiving rotatable members from the first track for discharging the same from the device.

8. A device for removing rotatable work-engaging members from a machining apparatus, the apparatus including a base, a rotatable shaft on the base, a rotatable work-engaging member removably positioned on the shaft, and a work-support slide supported on the base for relative reciprocation in a direction generally parallel to the shaft; comprising a bracket connected to said slide, a first-flanged track pivotally connected to said bracket, said track having an arcuate shape adapted to conform generally to the outer peripheral surface of a rotatable member for receiving and supporting the same, means connected to said first track and engaging said slide for adjusting the track vertically relative to a work-engaging rotatable member, and a gripping member adjustably positioned on said first track adapted to engage portions of a rotatable member supported on the first track.

9. A device for removing rotatable work-engaging members from a machining apparatus, the apparatus including a base, a rotatable shaft on the base, a rotatable work-engaging member removably positioned on the shaft, and a work-support slide supported on the base for relative reciprocation in a direction generally parallel to the shaft; comprising a bracket connected to said slide, a first-flanged track pivotally connected to said bracket, said track having a shape adapted to conform generally to the outer peripheral surface of a rotatable member for receiving and supporting the same, means connected to said first track and engaging said slide for adjusting the track vertically relative to a work-engaging rotatable member, and a gripping member adjustably positioned on said first track adapted to engage portions of a rotatable member supported on the first track.

10. A device for removing rotatable work-engaging members from a machining apparatus, the apparatus including a base, a rotatable shaft on the base, a rotatble work-engaging member removably positioned on the shaft, and a work-support slide supported on the base for relative reciprocation in a direction generally parallel to the shaft; comprising a bracket connected to said slide, a first track connected to said bracket, said

track having a shape adapted to conform generally to the outer peripheral surface of a rotatable member for receiving and supporting the same, means connected to said first track and engaging said slide for adjusting the track vertically relative to a work-engaging rotatable member, and a gripping member adjustably positioned on said first track adapted to engage portions of a rotatable member supported on the first track.

11. A device for removing rotatable work-engaging members from a machining apparatus, the apparatus including a base, a rotatable shaft on the base, a rotatable work-engaging member removably positioned on the shaft, and a work-support slide supported on the base for relative reciprocation in a direction generally parallel to the shaft; comprising a flanged track of arcuate configuration pivotally connected to said slide, means for adjusting said track vertically whereby said track may engage a work-engaging member in supporting relation, said slide being movable to slide work-engaging member from the shaft, an adjustable gripping member on said track adapted to grip the work-engaging member to maintain the same in an upright position, and means on said base for receiving said work-engaging member as it is removed from the track.

12. A device for removing work-engaging members from a machining apparatus, the apparatus including a base, a rotatable shaft on the base, a rotatable work-engaging member removably positioned on the shaft, and a work-support slide supported on the base for relative reciprocation in a direction generally parallel to the shaft; comprising a flanged track of arcuate configuration pivotally connected to said slide, means for adjusting said track vertically whereby said track may engage a work-engaging member in supporting relation, said slide being movable to slide said work-engaging member from the shaft, and means on said base for receiving said work-engaging member as it is removed from the track.

13. A device for removing work-engaging members from a machining apparatus, the apparatus including a base, a rotatable shaft on the base, a rotatable work-engaging member removably positioned on the shaft, and a work-support slide supported on the base for relative reciprocation in a direction generally parallel to the shaft; comprising a cradle movably connected to said slide, and means for adjusting said cradle relative to said shaft whereby said cradle may receive a work-engaging member in supporting relation, said slide being movable to slide said cradle relative to said shaft and to remove said work-engaging member from the shaft.

No references cited.